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Heat and water vapor fluxes over a lake: a LES and field campaign investigation.

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In regional hydrological systems, open water bodies such as lakes or wetlands are often important components of the landscape. However, the interactions between a lake surface and the atmosphere are complex and continue to be a critical issue in the improvement of numerical weather predictions and improved water management.
We use Large Eddy Simulations to investigate the influence of a small lake on local atmospheric dynamics. The results obtained from simulations will be compared to data obtained in a field campaign in Seedorf, Switzerland (carried out in august 2008). A scanning Raman Lidar over the Seedorf lake gives us spatial information on the temperature and humidity over and around the lake that are then compared to the simulation results. In addition, we will test an alternative evaporation model based on sensible heat flux; the heat flux derived from the LES results will be used to estimate the lake evaporation, based on a previously derived evaporation model, and the results will be tested against the evaporative flux inferred from the Lidar and fast response sensors.